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Review Article

Bridging protected areas along the Danube

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Abstract

This paper examines the role of transnational cooperation in conserving the ecological integrity of the Danube River through the DANUBEPARKS network of protected areas. As Europe's most species-rich river system, the Danube connects diverse biogeographic regions, yet faces increasing pressure from habitat degradation, pollution and hydrological modifications. Recognizing the need for a unified approach, protected area administrations across the basin have formed partnerships to address shared conservation challenges.

The paper traces the evolution of this collaboration from early bilateral agreements to the establishment of the DANUBEPARKS Association, a network fostering ecological connectivity and coordinated restoration. A key achievement is the development of the WILDisland concept, which identifies islands as critical habitats and indicators of riparian ecosystem health. Additionally, the network's advocacy efforts have contributed to the formation of the Danube WILDisland Ramsar Regional Initiative, securing international recognition and policy support for long-term conservation.

By bridging protected areas and aligning conservation goals across borders, DANUBEPARKS Association serves as a model for integrated river basin management. Its success demonstrates the power of trust, shared governance and cross-sector partnerships in overcoming political, economic and ecological barriers ensuring the sustainable management of one of Europe's most vital waterways.

Highlights

- Cross-country cooperation facilitates efficient conservation of shared natural resources.
- Common conservation goals unite and drive joint action across the Danube.
- Bottom-up initiatives evolve into sustainable structures for transnational governance.
- The WILDisland concept promotes islands as key habitats for river ecosystem health.

Key words: DANUBEPARKS, Danube, WILDislands concept, ecological connectivity, protected areas, transnational cooperation

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Introduction

The Danube is one of Europe's most ecologically significant rivers, serving as a vital corridor that connects more biogeographic regions than any other river on the continent. It supports the most species-rich river system in Europe, with around 2,000 vascular plants and over 5,000 animal species, including more than 40 mammals, 180 breeding birds, 100 fish species, and 12 reptiles and amphibians (Liška et al. 2015; Schmid et al. 2023).

Spanning 10% of continental Europe, the Danube basin is home to approximately 79 million people who rely on its waters for drinking, irrigation, energy production, and transport (ICPDR 2021a). As a green lifeline linking Central Europe with the Black Sea, it plays a central role in both ecology and human livelihoods. It has historically been in the roots of conflict for resource sharing since earliest human history, as direct consequences of its geographic setting, hydrogeological features and political, economic and cultural diversity (Linnerooth-Bayer and Murcott 1996; Murphy 1997; Schmid et al. 2023).

These dynamics, combined with its exceptional natural value, highlight the urgent need for integrated, cross-border cooperation—especially in the realm of nature conservation.

The current paper illustrates a bottom-up approach to international cooperation, grounded in shared values and interest in preserving the Danube's ecological integrity and promoting the sustainable management of its natural resources. It traces the gradual development of this cooperation from personal communication to the formation of a joint non-government organization (NGO) and turning it into an active regional political actor. The first section delves into the contemporary pressures on the Danube, tracing the history of its exploitation and conflicts, which raise the need for regional protection as well as international cooperation starting from the late 19th century. The second section explores the evolution of the bilateral transborder cooperation in the early 1990s, resulting in the practical establishment of the DANUBEPARKS Association in 2014, created as a regional tool for Danube-wide capacity building, fund mobilization, joint initiatives and planning. The third section highlights the expansion of DANUBEPARKS' interactions from local conservation projects to the political arena, including the conceptualization and practical establishment of the Danube WILDisland conservation concept and its upscaling to a Ramsar Regional Initiative (Fig. 1).

Figure 1. Helemba island, Duna-Iply National Park, Hungary – one among more than 900 secret jewels of the Danube, preserving threatened species and habitats in the heart of Europe.

Finally, the fourth section reflects on the lessons learned from this unique Danube-wide trans-border and cross-sector collaboration in nature conservation, based on shared values, mutual trust and strong regional partnerships.

Danube – a physical border or a vivid connection?

The Danube River has long been integral to the culture, history, and economy of the millions of people living in its basin. It continues to serve as a vital link between some of Europe's strongest economies (e.g., Germany, Austria) and some of its poorest regions (e.g., Moldova), spanning a vast cultural and political spectrum. Over time, human pressures have evolved from basic exploitation for transport and irrigation to more profound environmental impacts. Industrialization brought increased water pollution, loss of connectivity, and floodplain degradation, while disruptions in sediment transport, continuous riverbed incision, and altered hydrological dynamics have contributed to significant biodiversity loss (Liška et al. 2021; Schmid et al. 2023). These threats have evolved in a really volatile socio-economic context, characterized by shifting power balances, continuous political and military conflicts (World War II, Cold War, Russian-Ukrainian conflict) and growing energy demand, pressing the development of hydro- and nuclear power in the Basin. Simultaneously, a striving towards environmental protection gained momentum.

Due to its distinctively different hydromorphological conditions, the Danube is considered in three sub-regions Upper, Middle and Lower Danube. More than half of its entire course (56%) is classified as "heavily modified" under the EU Water Framework Directive (2000/60/EC) (Schmid et al. 2023). The river is affected by all major threats to riparian ecosystems, including flow alteration, pollution, habitat degradation, overexploitation, invasive species, and disrupted connectivity (Dudgeon et al. 2006; Tickner et al. 2020). The severity and nature of these pressures vary along its course, reflecting the differing hydromorphological characteristics of the three sections (ICPDR 2021b). The Upper Danube is most heavily impacted by fragmentation resulting from damming for hydropower and navigation; water quality and sediment issues threaten the Middle and Lower Danube, while the spread of invasive species is a great challenge, particularly in the lower reaches (Schmid et al. 2023). It should also be noted that upstream banks are 100% artificially structured with merely three free-flowing river sections and almost 90% loss of the former floodplain forests for the past 200 years (Schmid et al. 2023).

The shared reliance on Danube's resources underscores the necessity of cooperation for their fair and sustainable use. However, ongoing shifts in power dynamics have continually posed challenges to achieving peaceful and equitable solutions.

Formal cooperation along the Danube started with the Peace Treaty of Paris signed in 1856, which already divided Danube in two spheres of influence, establishing two commissions formed primarily focused on navigation. These early attempts at cooperation were deeply impacted by the Cold War, especially since the Danube remained the only major European river crossing and connecting the two blocks (Schmid et al. 2023). The post-war period accelerated transformation in the Danube Basin, driven by political tensions, rising energy demands, and the emergence of environmental movements. This culminated in the establishment of the International Association for Danube Research

(IAD) in 1956, aimed at fostering collaborative scientific efforts to address shared environmental challenges. The formation of the European Union in 1993 also meant shared competences and responsibilities in environmental and trans-European networks. Furthermore, the earlier fall of the Iron Curtain also allowed for the establishment of the International Commission for the Protection of the Danube River (ICPDR) in 1998. ICPDR later undertook the obligations to carry out the transboundary aspects, directly related to the implementation of the EU Water Framework Directive (2000/60/EC) (also known as WFD), (European Parliament and Council 2000), dealing with water quality and pollution. It has to be noted that currently 9 of the ICPDR Member States are also members of the EU (the European Union is a separate entity on its own), while 5 countries are not, which means that the EU nature conservation legislation alone is not able to provide sufficient incentive or obligation for cooperation.

The 90s of the XX century also saw a boost in the formal establishment of managed protected areas – national and nature park administrations in many Danube countries. An interesting detail is that the formal political division also came with a difference in the understanding and implementation of ecological networks in Central- (CE) and South-eastern Europe (SEE). While CEE applied an ecostabilization approach based on horizontal and regional aspects of regional planning; CE relied on a bioecological approach, grounded on segregation, which led to the necessity to counteract fragmentation and develop multi-functional land use (Jongman and Kristiansen 2001). Currently, a total of 14,9% of the Danube is under some form of local protection, while barely 9,2% is under integrated protection, meaning not only the mere existence of designated PAs comprising water bodies, but a more comprehensive approach, including some kind of conservation upstream as well as target protection (Abell et al. 2017). This practically means not only cultural and managerial differences of protected areas, but also conceptual and legislative discrepancies; while at the same time, they all faced and are still facing common problems and challenges along the river course, setting the scene for cooperation.

From bilateral co-operation to Danube-wide perspectives

The growing demands and pressures on the Danube for navigation, hydropower, forestry and agriculture did not overshadow the recognition of its immense significance for pan-European biodiversity and ecosystem health, naturally leading to a stronger incentive for its preservation. The history of contemporary national parks in Europe starts around the first decade of the 20th century with an additional boost from the 1930s onwards. It is at that time when the first bilateral protected area between Poland and Slovakia was designated (1932) and also the first nature reserve along the Danube – the Letea Forest in Romania (1930) (Jones-Walters and Čivić 2013). A cornerstone for the development of the nature protected areas was the adoption of the Convention on Wetlands (1971), which remains up to today the only treaty devoted to a particular ecosystem type. The formation of the European Union in 1993 and the adoption of target nature conservation policy framework – the Council Directive 79/409/EEC (Birds Directive), Council Directive 92/43/EEC (Habitats Directive), Council Directive 2000/60/EC (Water Framework Directive) further increased the need to develop and maintain formal protected areas (PAs) in the Member States. Despite the historic, political and management differences from West to East,

the 1990s saw the establishment of many new protected areas with their own administrative structures and devoted staff along the entire Danube from Germany to Bulgaria and the process continues with new actively managed protected areas continuing to emerge throughout the 2000s.

Declaration of Tulcea (2007)

The newly formed PA administrations quickly realized that is difficult to preserve a shared resource in a local and isolated manner. Despite the challenges arising from the extreme difference in the political priorities, capacity and resources to the use of 7 different languages along the Danube, bilateral communication based on private contacts and shared passion for nature and conservation started as early as the 1990s. The following enlargement of the European Union and the fall of the Iron Curtain provided new dimensions and impulse for cooperation. A milestone for future cooperation was the highly successful Danube Regional Project (DRP) of UNDP/GEF (2002–2007). An international workshop organized within that project resulted in the signing of the "Declaration of Tulcea" in 2007 (River Network of Protected Areas 2007) (Fig. 2). The document acknowledged the role of protected areas in conserving the European natural heritage, especially in the context of the Convention on Wetlands and the Convention on Co-operation for the Protection and Sustainable Use of the Danube River (Sofia, 1994). It launched the development of a "Danube River Network of Protected Areas" to enhance cooperation, ensure wise-management, boost experience exchange, promote awareness, seek partners and develop policies for Danube-wide conservation. At the time, the Declaration was signed by representatives of 8 countries from the entire stretch of the Danube.

Figure 2. Signatories of the "Declaration of Tulcea" in 2007. The document launched the "Danube River Network of Protected Areas," recognizing the role of protected areas in conserving European natural heritage under key international conventions. It was signed by representatives of 8 countries from the entire stretch of the Danube: nature conservation authorities (Serbia and Slovakia) and protected area administrations (from Bulgaria, Germany, Hungary, Romania and Ukraine).

"DANUBEPARKS - Jointly for our common future" 2009–2012

That declaration led to the first practical step with the "DANUBEPARKS - Jointly for our common future" project, funded by the EU Programme for European Territorial Cooperation for South-East Europe (ETC-SEE) in 2009–2012. It was the first systematic attempt to address common challenges on a Danube-scale. The project started with the signing of the "Declaration of Vienna" (2009) which identified the main joint challenges common for all Danube sections (among them habitat fragmentation, hydro-morphological alterations and the need for a common corporate identity) and pledged the formal establishment of the "Danube River Network of Protected Areas". Already at that point there was a clear statement of the basic goals: "a long-term platform for knowledge and experience transfer", "joint Danube-wide strategies and concepts", "coherent management of the Danube natural heritage", "strengthening each Protected Area at the local level through the development of a strong, joint voice for nature conservation on a Danube-wide scale" (DANUBEPARKS 2012). The initial partnership comprised of 12 protected area administrations from 8 countries from Lower, Middle and Upper Danube, together with an invitation for expansion to other partners along the main course as well as the tributaries. Signatories were local authorities (Bulgaria, Germany, Serbia, Slovakia), protected area administrations (Austria, Bulgaria, Croatia, Hungary) and one NGO (Slovakia). The project relied on a three-step approach – knowledge and experience exchange, development of strategic documents of Danube-wide relevance and pilot conservation measures (DANUBEPARKS 2012).

The project design relied on a number of on-site meetings and workshops, hosted by a different institution/country each year. The opportunity to interact in person and spend time together in both a working and non-formal environment was one of the key prerequisites for the establishment of a sense of mutual trust and partnership to identify common challenges and discuss various solutions. The project comprised a survey of the project partners, completed by the University of West England, which aimed to analyze and evaluate the processes and practices of the internal and external communication between the project partners from eight countries. The results clearly showed that partners saw communication and cooperation as the most important project objective, even more than practical conservation, also indicating their preference for face-to-face and task force meetings (University of the West England 2010). The opportunity to visit different restoration sites, often just across the border, yet previously completely inaccessible due to a variety of political reasons, allowed sharing innovative approaches and exploring new dimensions of river restoration and cooperation, which previously seemed impossible. Trust, collective interest and mutual respect between project members were fostered by fulfilling expectations and requirements.

The second pillar and the development of common strategic documentation provided the basis for a joint methodology and understanding of shared problems from pressures (ex. Strategy on Conservation and Navigation (Zinke 2011)) to flagship species protection (ex. Action Plan for the Conservation of the White- tailed Sea Eagle along the Danube (Probst and Gaborik 2012)) and future planning (ex. Perspectives for Danube Floodplain Forests). One other key prerequisite for success was the immediate implementation of the developed strategies at a local level, in order to clearly demonstrate the benefit of the joint approach and experience exchange (DANUBEPARKS 2012).

The implementation of the developed strategies at a local level as well as practical on-site restoration measures (removal of transverse artificial structures, purchase and management of grasslands, reforestation with native trees; and grassland restoration) in Austria, Hungary and Slovakia helped the partners see the practical benefit of the joint cooperation and paved the way to the development of the Danube-wide habitat corridor.

At the end of that project the main challenges as seen by the project members were geographic disparity and working in a diverse cultural environment (University of the West England 2010). At the same time, the entire team clearly saw the need to anchor the Danube river Network of Protected Areas at a European and national political level, as well as to establish a sustainable organizational structure to frame and formalize the cooperation (DANUBEPARKS 2012).

DANUBEPARKS Step 2.0 project (2012–2014)

Using the momentum gained, the partnership consortium expanded to 20 members and implemented the DANUBEPARKS Step 2.0 project (2012–2014). The network recruited new partners from Romania, Moldova and Germany. One of the main outcomes of that project is the formal establishment of the "DANUBEPARKS – Danube River Network of Protected Areas – Das Netzwerk des Schutzgebiete" as an Austrian-based NGO with a headquarters hosted by the Donau-Auen National Park in September 2014 (DANUBEPARKS 2014). This step was preceded by careful preparation of guiding principles, statute and structure architecture.

The Governing Bodies of DANUBEPARKS established at the time: the General Assembly, the Management Board, and the Audit Commission, were kept with only minor modifications until today. The General Assembly serves as the primary decision-making body, comprising legal representatives from all member organizations. It is responsible for key strategic decisions, including the approval of statutes, the annual plan and budget, the election of the Management Board, and the appointment of the Audit Commission.

The Management Board functions as the operational body, founded on principles of trust, equality, and fairness, deliberately designed to ensure balanced representation across the Upper, Middle, and Lower Danube regions. Elections follow a transparent and well-defined process, informed by best practice and with a three-year mandate. Participation is voluntary and unpaid, with support provided by the respective park administrations.

There is an Audit Commission responsible for monitoring compliance with the Statutes and conducting internal financial audits.

The day-to-day operations are supported by a Secretary General and more recently, by the full-time staff appointed at the Association.

To become a Member, a given entity needs to manage some territory along the Danube or its tributaries in line with the principles shared by the network, intentionally opening the Association for future members from protected area administration to public bodies such as forestry establishments (public or private) and NGOs. The organization is self-funding, relying on annual membership fees used for transport and operational costs, individually adjusted to national average income and size of protected area to ensure sufficient level of commitment, while respecting the specific features of each partner. The approach was widely accepted and is used until present as a necessary condition to use the

full potential of the network. The Association also accepted Observers, which share the main goals of the network, but either do not manage territories or cannot pay the membership fees.

DANUBEparksCONNECTED INTERREG project (2017–2019)

A third key project in the development of the DANUBEPARKS was the DANUBEparksCONNECTED INTERREG project (2017–2019), which included 15 partners from 9 countries. It focused on the establishment of the Danube Habitat Corridor as a benchmark initiative of the Association, addressing all three elements: air (Danube Free Sky); water (WILDisland, Box 1) and land (dry habitat and forest corridor). The fourth element - fire, represented communication. It was designed to harmonize the activities of partners with many different languages, cultures and religions, and strong communication has proven a key element in establishing a vital network, considering that the Danube is the most international river in the world. These four guiding elements were developed into project proposals which turned into separate LIFE-funded EU projects, implemented by DANUBEPARKS member organizations. They also caused DANUBEPARKS to broaden its scope and cooperate with other interested sectors (waterway navigation, hydropower companies, forestry enterprises - WILDisland, electricity companies – Free Sky) in formulating win-win solutions and pilot measures (Fig. 3). The Association continued to invest in intensive face-to-face exchange and interactions, for example organizing a bicycle trip from Germany down to Romania to help its team better know and understand the local partners, their needs, economic, cultural and political specifics. The partnership remained focused on the mutual benefits from attracting funding for exchanging experiences; trans-border field trips and especially pilot restoration measures that would generate a tangible difference at ground level.

At 2025 and following the most recent General Assembly, the organization operates with a total of 19 active partners (6 from Upper, 8 from Middle and 5 from Lower Danube) and 5 Observers. Their commitment and motivation is proven by the fact that General Assemblies are attended by an average of 14 Members (including Observers) and quorum has always been secured.

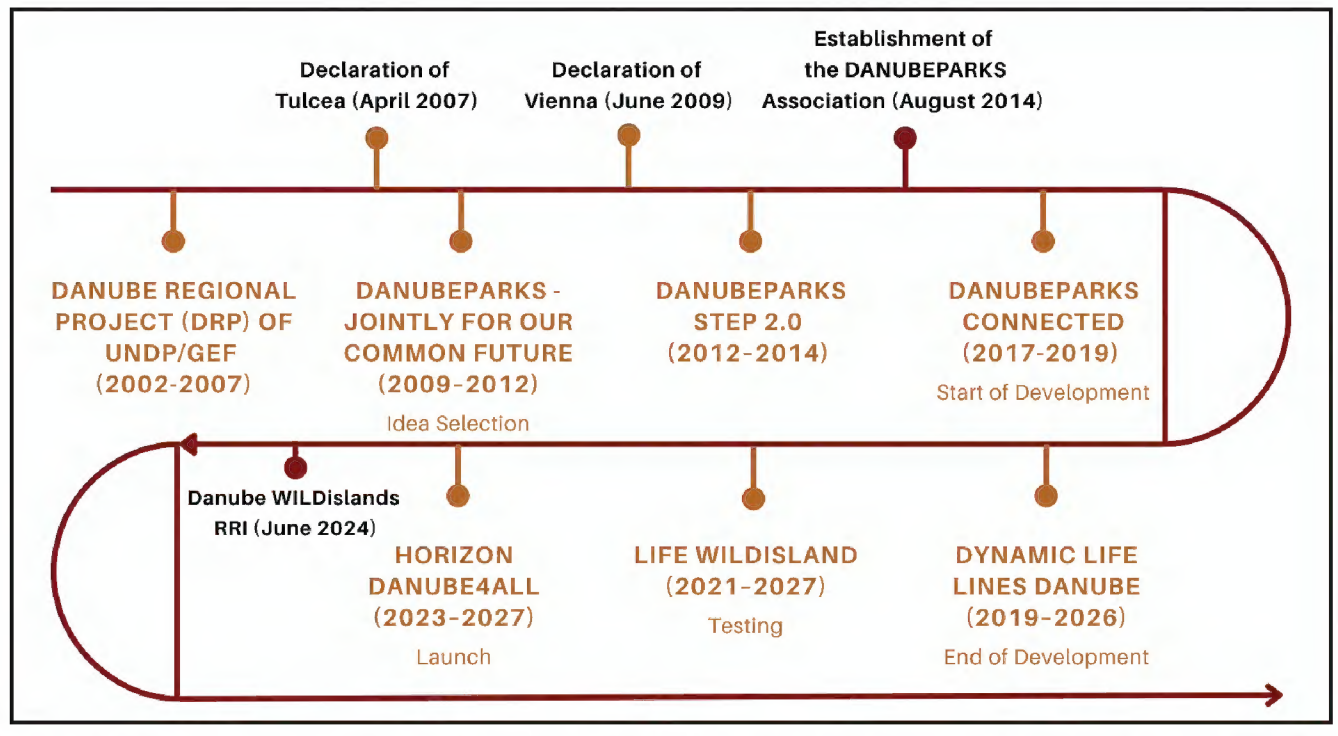
Declaration of Tulcea (April 2007)
Declaration of Vienna (June 2009)
Establishment of the DANUBEPARKS Association (August 2014)
DANUBE REGIONAL PROJECT (DRP) OF UNDP/GEF (2002-2007)
DANUBEPARKS - JOINTLY FOR OUR COMMON FUTURE (2009-2012)
Idea Selection
DANUBEPARKS STEP 2.0 (2012-2014)
DANUBEPARKS CONNECTED (2017-2019)
Start of Development
Danube WILDislands RRI (June 2024)
HORIZON DANUBE4ALL (2023-2027)
Launch
LIFE WILDISLAND (2021-2027)
Testing
DYNAMIC LIFE LINES DANUBE (2019-2026)
End of Development

Figure 3. Timeline and main development of the DANUBEPARKS – Danube River Network of Protected Areas – Das Netzwerk der Schutzgebiete" from its formation to its first large-scale international projects and recognition.

At the same time ensuring the participation of all partners, particularly in the Lower Danube section, where limited financial resources, staff capacity, and language barriers restrict engagement remains a persistent challenge. There is also no member from Ukraine, due to technical reasons further exacerbated by the ongoing military conflict. To counteract these limitations, DANUBEPARKS has established a regional office in Bulgaria, provided financial support for participation in meetings, and organized targeted events in Moldova to strengthen involvement. Nevertheless, staff turnover within member institutions means that continuity still depends on a relatively small core of committed individuals.

Membership remains restricted to organizations managing protected areas, which ensures a strong conservation mandate but excludes other key sectors such as navigation, hydropower, and agriculture. While the network has engaged with these sectors through joint projects (e.g. LIFE WILDisland, Danube Free Sky) and consultation processes (e.g. update on the Joint Statement on Navigation, developed by ICPDR together with the Danube and Sava Commissions or engaging in the actions of the Priority Area 6 "Biodiversity, Landscapes and Air & Soil Quality" of the European Union Strategy for the Danube Region (EUSDR) and EU Mission: Restore our Ocean and Waters), its role has been primarily one of dialogue and awareness-raising rather than direct confrontation. In cases of major issues of common concern, such as riverbed incision, insufficient or inefficient infrastructure to guarantee safe fish passage or newly appeared infrastructure conflicts, such as the proposed Turnu Măgurele–Nikopol hydropower facility affecting Persina Nature Park, the Association can currently only act as a 'watchdog,' flagging concerns and informing members, but without the political strength to halt developments.

Box 1. Danube WILD islands Habitat Corridor.

The DANUBEparksCONNECTED was the first project to clearly formulate the WILDislands concept of using islands as indicators for near-natural hydrological regimes and healthy riparian ecosystems. As part of this initiative, the first-ever comprehensive inventory of all Danube islands was conducted, revealing that the Danube Wild Island Habitat Corridor consists of approximately 900 islands covering more than 138,000 hectares (Fig. 4). Among them, 385 islands were classified as "near-natural", with 147 islands (14,000 hectares) remaining largely untouched by human activity. Most Danube islands are located in Hungary (254) and Romania (167). Historically, around 2,000 islands existed along the Austrian stretch of the river alone, but today only 83 remain following river regulation. The average island size increases downstream: in the Upper Danube the total island area is relatively small (Germany 263 ha, Austria 714 ha, Slovakia 1,700 ha), while in Hungary (Middle Danube) islands already cover about 6,700 ha (Fig. 4). The Lower Danube contains by far the largest island habitats, with approximately 76,000 ha in Romania, 31,000 ha in Ukraine, and 10,500 ha in Bulgaria (Sommerwerk et al. 2022). An interactive map can be found at:

https://wildisland.danubeparks.org/wildisland-map/

These islands not only support some of the most pristine and well-preserved alluvial forests, a habitat of European conservation concern (Frank and Kmetova-Biro 2023), but also serve as critical breeding grounds for bird species. Surveys conducted in 2011 and 2013 confirmed that nearly 80% of the Danube population of the Little Ringed Plover (*Charadrius dubius*) nests on vegetation-free islands composed of gravel and sand (Schmidt et al. 2015).

Despite their ecological significance, Danube islands are highly vulnerable. Their formation, hydrological regimes, biodiversity, and natural succession are increasingly threatened by human activities, climate change, and invasive species. Maintaining and restoring connectivity among ecosystem elements and processes is considered one of the most effective strategies to counteract the negative effects of habitat fragmentation and the diminishing size of natural patches (Crooks R. and Sanjayan 2006).

The recognition of islands as flagship habitats which exemplify intact lateral, longitudinal, and vertical connectivity, led to the development of the WILDisland conservation concept. It promotes islands as unique ecological sites within river ecosystems, showcasing intact river dynamics, natural sediment regimes, and the original beauty of undisturbed river landscapes, along with their characteristic fauna and flora.

The concept evolved into a separate project, Danube Wild Island Habitat Corridor (LIFE WILDisland), which was submitted for funding to the European Commission's LIFE programme.

https://wildisland.danubeparks.org/

Figure 4. A. Distribution of more than 912 islands along the Danube, from the source to the Delta. The islands vary greatly in size, structure, and origin. While many are altered or intensively used, others retain near-natural dynamics and host habitats of high conservation value, together forming the Danube Wild Island Habitat Corridor; **B.** Distribution and classification of WILDislands along the main Danube countries. Around 16% are classified as natural islands, most of them found in Lower Danube, the other 26% are considered near natural with high potential for conservation and the remaining 58% are estimated to be under intensive human pressure and use.

At the same time, the Association is constantly seeking to enter into active dialogue with the other sectors to develop better understanding and exchange practical experience in problem solving. In this sense, DANUBEPARKS can be seen as a tool for advancing transformation through nature conservation and as one of the dimensions of socio-economic change suggested by Berger et al. (2024).

From practice to policy – the Danube WILDisland Ramsar Regional Initiative

The potential of the WILDisland concept to recruit political support and European-wide recognition was seen as soon as the idea was born with the DANUBEparksCONNECTED project. The initiative received its first formal recognition from the EU-Forum of Nature and Biodiversity Directors for establishing EU-level Green Infrastructure and strengthening the coherence of Natura 2000 sites and with the signing of a Danube-wide commitment from all DANUBEPARKS directors (DANUBEPARKS 2019).

Using near-natural islands to promote natural hydrological regimes, support riparian habitats and species of European conservation significance, and actively work with other sectors to develop win-win restoration projects represents a unique initiative to contribute to the key commitments of the EU Biodiversity Strategy

2030. The concept has direct relevance for the ambitious goals of protected areas coherence, restoration, and conservation of European free-flowing rivers (see Stoffers et al. 2026), including the removal of obsolete barriers and enabling transformation change set (European Commission 2021). The WILDislands approach also addresses the priorities defined in the EU Green Infrastructure Strategy (European Commission 2019) and promotes converting "grey" to "green" infrastructure, contributing to developing a Danube TEN-G (Trans-European Network of Green Infrastructure), to be balanced with TEN-T (Transport). Implementing hydro-morphological and riparian ecosystem restoration measures also directly contributes to the goals set by a number of other EU policies, such as the EU Water Framework Directive, EU Regulation on Invasive Alien Species, EU Forestry Strategy, EU Strategy for the Danube Region, EU Floods Directive, EU Strategy on Adaptation to Climate Change and ultimately to the European Green Deal. All the above-mentioned nature-conservation policies are of relevance for the European Union Member states, and the only three countries, which are not members of EU on the main course – Serbia, Ukraine, and Moldova - have candidate status at 2025 and need to transpose the relevant EU legislation into their nature conservation policies. Until that happens, however, these three candidates, together with the Danube-relevant EU-member states, have all ratified the Convention on Biodiversity and are therefore subject to the 2030 Targets of the Kunming-Montreal Global Biodiversity Framework (CBD 2022), being therefore bound to focus on the conservation and restoration of inland water ecosystems, promoting nature-based solutions.

Considering all these political instruments, agreements, and treaties, the DANUBEPARKS team still needed a formal driver to bind these targets and goals into a permanent structure with political recognition and use it as a vehicle for change. Another intergovernmental treaty, ratified by all countries along the Danube course, is the Convention on Wetlands (Ramsar Convention). It provides for the establishment of Ramsar Regional Initiatives (RRIs) to achieve the objectives of the Ramsar Strategic Plan (Convention on Wetlands 2015) and support cooperation and capacity-building on wetland-related issues in specific regions. The RRIs are seen as a platform for collaborating with technical experts and representatives of intergovernmental bodies, International Organization Partners, NGOs, local communities, and private companies. They have their own management and coordination bodies, and act separately from the Convention but can also receive funding and support (Convention on Wetlands 2022). A key aspect of RRIs is that although they do operate through voluntary international cooperation on wetland-related issues, they involve the national Focal Points of the Member States, which typically represent the relevant ministries and nature-conservation-related authorities.

The idea for using a Ramsar Regional Initiative as a tool for gaining political recognition and mobilizing additional financial support was inspired by the experience of the DANUBEPARKS members (Slovakia, Romania, Bulgaria) with the already existing and operating Carpathian Wetland Initiative (CWI) and Black Sea Coastal Wetlands Initiative (BlackSeaWet). Furthermore, it was seen that the RRIs could achieve a high level of integration between the Convention and EU directives and contribute to improving wetland management in line with goals adopted by EU member states (ICPDR, EUSDR). This is why the establishment of a Danube WILDisland Ramsar Regional Initiatives was set as one of the main long-term conservation goals of the LIFE Danube WILDisland Habitat Corridor project (2021–2027).

The first step towards its realization was the elaboration of a Communique, signed by all Danube countries in May 2022, stating the necessity and willingness to support the establishment of a Danube-wide RRI. It happened during an unprecedented project kick-off meeting, attended by ambassadors and attachés of all Danube countries who gathered in Vienna, Austria. The preparation of this document and the contact with all the Ministry of External Affairs to secure signatures already set the stage. Motivated by that initial success, representatives of the DANUBEPARKS members (Donau-Auen NP for Upper Danube; Kopackirit Nature Park for Middle Danube and Persina Nature Park and the Danube Delta Biosphere Reserve Authority for Lower Danube) then took part in the Wetlands Convention 14th Conference of the Parties (CoP14) to present the idea in Geneva, Switzerland in 2023. The DANUBEPARKS team used several key messages to introduce the idea to the potential Member States: direct contribution to the objectives of the Convention on Wetlands and the relevant obligations of the Member States; long-term focus on key EU Green and Blue Infrastructure; possible linkage of the new RRI with the EU Strategy for the Danube Region (EUSDR) and filling of the geographic gap between the existing CWI and BlackSeaWet, providing countless additional opportunities for networking and cooperation. The aim was to stress the potential of the Danube WILDisland to create unique wise-use network of protected areas in the Danube region and focus on the practical implementation of the Ramsar Strategic Plan and Biodiversity Strategy, strengthening the synergies and joint cooperation of various multi-national, European and national institutions. The meetings and discussions at the CoP14 were the first formal opportunity to connect to the national focal points in person and establish or strengthen the existing personal connections with them as decision-makers and possible supporters of the RRI. The fact that a Danube-wide DANUBEPARKS delegation took part in the event and engaged in various non-formal discussions and events significantly contributed to the overall goal. Besides being a clear signal for joint commitment and shared interests, it strengthened the internal sense of transparency and trust among the members of the DANUBEPARKS Association and assured them that all members will be heard and represented in the new RRI, boosting their motivation and incentive to actively lobby and work for its establishment.

Following CoP14, the Ramsar Secretariat published a call for new RRIs in April 2023 (Diplomatic Note 2023/3) (Convention on Wetlands 2023), so the DANUBEPARKS started the preparation of the formal application. One of the necessary steps, which took most time and political lobbying, was the successful obtaining of National Support Letters from all Danube countries invited as Member States – Germany, Austria, Slovakia, Hungary, Croatia, Serbia, Bulgaria, Romania, Moldova and Ukraine, from source to delta, all finally secured in time. The winning factors were the personal connections of DANUBEPARKS member institutions with the Ramsar focal points of the relevant countries and the fact that they were already previously introduced to the idea at the CoP14 and through regular follow-up correspondence. There were two decisive aspects for obtaining national support – DANUBEPARKS volunteered to develop the entire application documentation without placing any administrative burden on the Member States, while at the same time, no strict financial obligations stemmed from the formal membership in the new RRI. The process was steered through the WILDislands LIFE project.

The next substantial challenge was to find a country willing to formally submit the application for the new RRI. This is why DANUBEPARKS initiated

a series of meetings with the International Commission for the Protection of the Danube River (ICPDR) as an inter-governmental entity, which could provide formal hosting of the RRI. Finally, the ICPDR welcomed and accepted the offer to take over the patronage of the future Danube WILDisland Ramsar Regional Initiative and to submit the proposal as an official host of the Initiative (Resolution OM-26, 2023). The decision was also based on the explicit condition that DANUBEPARKS will develop the documentation and there will be no financial or workload burden for IPCDR. In September 2023, the complete set of application documents was submitted by the ICPDR Executive Secretary to the Secretary of the Convention on Wetlands and some later budgetary and timeline revisions were re-submitted in December 2023 and February 2024.

Finally, the Danube WILDisland Ramsar Regional Initiative was adopted at the 63rd meeting of the Ramsar Standing Committee (3–7 June 2024; Gland, Switzerland) (Convention on Wetlands 2024). An additional funding proposal was submitted and approved by the Federal Ministry for the Environment, Nature Conservation, Nuclear Safety and Consumer Protection for 2024–2027. The secured funding will be used for setting up a targeted RRI Coordination Office in Lower Danube, the development of Long-term Strategic and Communication Plans, expert workshops, experience exchanges and study visits; as well as coordinated Danube-wide practical measures and public campaigns.

The success of the endeavor is undoubtedly related to the following main factors: years of systematic networking and close cooperation with all relevant parties (national focal points, ICPDR, Convention on Wetlands), very much based on personal contacts and interactions for developing a sense of mutual trust and understanding. Additionally, the methodical and consistent approach in developing the entire concept with clear messages, concrete steps and pilot projects, combined with the history and experience of the DANUBEPARKS members also contributed to proving the efficiency and feasibility of the proposed measures, as well as the capacity of the network to implement it. A decisive factor was the bottom-up approach offering all relevant institutions minimal staff involvement and no financial obligations, while at the same time clear opportunities for contributing to their national goals and obligations for wetland conservation derived from the ratification of the Convention on Wetlands, as well as an abundance of EU-bound obligations related to restoration and green infrastructure. Another cornerstone was the concise formulation of the goals of the RRI and the deliberate attempt to translate its potential significance for the specific agenda of each of the approached stakeholders – Member States, ICPDR, EUSDR, Convention on Wetlands Secretariat, stressing the potential cross-sector and cross-policy synergies. Clear and regular communication with the decision- and policy-makers was a key prerequisite for the successful establishment of the RRI. Based on the current experience and best practices (Convention on Wetlands 2019), the Danube WILDisland RRI was set up, building on the capacity of an existing NGO and establishing an additional permanent coordinating structure with full-time dedicated staff to ensure efficiency and sustainability.

At the same time, this additional regional structure in Lower Danube, which has recruited growing political support, further establishes the DANUBEPARKS Association as an active and experienced regional actor, aiming to anchor policies and further strengthen ecological connectivity and non-intervention management as best practice approaches of wetland conservation.

With the successful establishment of the RRI and initial support from the Ramsar Secretariat's Core Budget and a targeted grant from Germany, the next challenge will be to ensure its long-term vitality. Experience from other RRIs shows that limited financial resources, weak engagement of Contracting Parties, and insufficient coordination and dialogue are common risks, which have in some cases even led to loose impetus (Convention on Wetlands 2019, 2023). Germany has already emphasized the need for a stronger sense of ownership and shared responsibility among all participating countries, which will be a key test for the Initiative. Unlike most RRIs, the Danube WILDisland was initiated and coordinated by an NGO rather than governments, which increases the need for additional efforts to mobilize national focal points and local authorities.

Even the initial steps already pinpoint similar challenges: while 16 DANUBEPARKS members contributed priorities for the development of the Long-term Strategic Plan, only 5 of the 10 Member States responded, with gaps particularly in the Middle (Croatia, Serbia) and Lower Danube (Romania, Moldova, Ukraine). Finding mechanisms to keep countries regularly informed and engaged therefore remains a critical task. So far, the Initiative relies on showcasing good practices and tangible successes to demonstrate added value and encourage stronger political backing and future financial support (Box 2).

Formally recognized as an Observer to the Convention, the RRI now provides DANUBEPARKS members access to international policy discussions. However, the Convention on Wetlands itself lacks strong enforcement tools, relying primarily on diplomatic pressure, reporting obligations, and the Montreux Record to address shortcomings. These are all mechanisms that create reputational but not legal consequences. This naturally limits the RRI's ability to drive binding political change. Its role therefore lies more in capacity building, awareness-raising, lobbying, and implementing concrete conservation projects, while using the visibility and endorsement of the Convention to mobilize funding and align actions with contemporary wetland policies.

Box 2. Transfer and replication of the WILDisland concept.

With its broad applicability, strong institutional partnerships, and proven cross-sectoral cooperation, the **WILDisland concept** holds significant **replication potential**, both within and beyond the Danube Basin. Its cross-sectoral approach provides a **robust framework** for extending its impact beyond its original regional scope.

As an example the Rhine, as a navigable river with similar ecological challenges, provides a valuable setting for applying WILDisland principles and strengthening cross-sectoral collaboration. DANUBEPARKS delegation visited several restoration projects along the Rhine in 2024 in order to establish successful cooperation and experience exchange, replicating the best practices and lessons learnt from our Danube-wide cooperation. Additionally, a WILDisland-inspired internship completed in 2024 resulted in the mapping of a total of 179 islands and clusters of small islands, classified in sand, rock, tree and other islands along the Rhine (Gruenendieck 2024). Despite even greater pressure from navigation and infrastructure, some pilot projects and initiatives have already been implemented by the numerous institutions working in shared cross-border protected areas.

Beyond the Rhine, the WILDisland approach for restoration is also applicable along the major tributaries of the Danube and there is an active exchange with some fellow projects, such as the LIFE RESTORE for MDD, aiming to strengthen the long-term cooperation of DANUBEPARKS and the UNESCO Five-country Biosphere Reserve Mura-Drava-Danube and upscaling of the Danube WILDisland Ramsar Regional Initiative as a possible future joint activity. Similarly, a Cooperation Agreement with the Lower Prut Natural Reserve was signed in June 2023.

The extensive replication potential of the WILDisland concept aligns directly with the objectives of the newly adopted EU Biodiversity Strategy 2030, especially considering its goals for expanding the amount of protected areas, improving the management and protection of freshwater ecosystems and ensuring 25 000 km of free-flowing rivers, contributing to the broader European vision for biodiversity conservation and ecological restoration.

Bridging conservation - DANUBEPARKS today

The DANUBEPARKS Association as a tool for capacity building, cross-border cooperation and mobilization of funds is not a unique establishment for Europe. The EUROPARC Federation is likely the oldest and biggest network for Europe's natural and cultural heritage (1973), uniting hundreds of responsible authorities and thousands of Protected Areas in 36 countries. Such a broad continental scope, however, is inevitably focused on the greatest common challenges and issues, while smaller-scale regional or local projects can remain overlooked. There are similar structures, united by regional problems, such as the very experienced Alpine Network of Protected Areas (Alparc), founded in 1995 uniting 47 protected area administrations from 6 countries and the younger Carpathian Network of Protected Areas (CNPA) (1995). The DANUBEPARKS Association, although attempting to use these best-practice examples, is, however, among the first of its scale dealing with riparian conservation in Europe.

The NGO stemmed from the need to build on existing local bilateral cooperation and successful Danube-wide initiatives and grew into a permanent structure with a Headquarters in Upper Danube (hosted by Donau-Auen National Park, Austria); Secretariat in Middle Danube (hosted by Kopackirit Nature Park, Croatia) and Regional Office in the Lower Danube (hosted by Persina Nature Park, Bulgaria). As of 2025 the Association operates with 18 members from all 9 Danube countries (except Ukraine, although its cooperation is actively sought) and 3 Observers with a few new applications from Upper and Middle Danube recently received. It showcases a bottom-up approach that links nature conservationists across Europe based on mutuality, trust and a shared ownership in terms of future direction and management (Fig. 5).

The Association operates through continuous engagement with its partners, following an initial phase that emphasizes personal relationship-building via on-site visits, joint workshops, and meetings. Over time, it has developed beyond a simple network of members, establishing its own identity and governance structures to effectively represent both collective and individual interests. In addition to facilitating cross-border cooperation, DANUBEPARKS provides a strategic platform for policy engagement at the Danube-wide level. This includes participation in key policy discussions and advocacy efforts within frameworks such as the International Commission for the Protection of the Danube River (ICPDR), the EU Strategy for the Danube Region (EUSDR), and the Convention on Wetlands. As an independent entity, the Association is able to address politically sensitive topics that individual members may find challenging to engage with directly.

A key incentive for participation in the network is its capacity to centralize project development, administration, and implementation. This approach reduces the administrative burden on individual members while ensuring the effective execution of conservation initiatives. Through a structured and systematic process, DANUBEPARKS covers the entire project cycle, from planning and implementation to follow-up monitoring. This framework not only enhances conservation outcomes but also reinforces motivation among its members, who see their ideas gradually translated into tangible restoration actions.

Initially founded on voluntary participation and shared conservation values, the Association has increasingly adapted to address cultural, economic, and political differences among its members. It operates through a problem-solving

Figure 5. DANUBEPARKS General Assembly 2023, held in Lipót, Hungary, bringing together partners from different countries and cultures to exchange experience and coordinate joint conservation activities.

approach, ensuring a fair distribution of projects and resources among its members Danube-wide as a fundamental condition for trust and cooperation across the region. However, the long-term sustainability of this model depends on securing stable institutional structures and full-time staff. Currently, the Management Board operates on a voluntary basis despite its significant responsibilities, highlighting the need to explore sustainable funding solutions.

Another important aspect is that while DANUBEPARKS Association aligns with broader European conservation strategies, it is striving to implement locally tailored solutions to challenges identified by protected area managers. This positioning enables the Association to function as a reliable regional conservation actor, strengthening ecological connectivity, promoting non-intervention management as a best practice for wetland conservation, and fostering cooperation with stakeholders at both practical and policy levels.

Conclusion

Effective environmental management along the Danube—the world's most international river—requires strong transboundary cooperation built on mutual trust and understanding. The DANUBEPARKS Association exemplifies the potential of integrated river basin management by uniting protected areas and aligning conservation efforts across borders. Its achievements highlight the power of shared governance and cross-sector collaboration in addressing political, economic, and ecological challenges, contributing to the long-term sustainability of one of Europe's most vital waterways.

The Association's evolution reflects a bottom-up approach, initially driven by personal connections and local initiative, which gradually developed into a structured organization with its own governance and decision-making mechanisms.

This transformation has enabled the Association to articulate common interests, mobilize political and financial support, and implement on-the-ground conservation measures. A key factor in this success has been a commitment to equitable participation, fair resource distribution, and consensus-based decision-making. By gaining legal recognition and political influence, such locally driven networks can grow into established regional actors, easing the administrative burden on individual partners by facilitating lobbying, advocacy, and funding acquisition.

Positioned at the geographic and political crossroads between the Alps and the Carpathians, DANUBEPARKS has developed a distinct identity, structure, and flagship initiatives such as the WILDisland concept. By fostering transboundary and cross-sector cooperation, it not only strengthens conservation efforts along the Danube but also serves as a model for establishing island corridors on other major European rivers, including the Rhine and the Sava.

Additional information

Conflict of interest

The authors have declared that no competing interests exist.

Ethical statement

No ethical statement was reported.

Use of AI

No use of AI was reported.

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Author contributions

V. Rožac and G. Frank participated in the creation of the DANUBEPARKS Association, preparing and implementing the projects described, serving as a President of the Association (V. Rožac) and Secretary General (G. Frank). M. Marušić, who serves as Secretary General since 2024, provided information and designed the figures. E. Kmetova-Biro led the writing of the manuscript. V. Lagutov provided the scientific supervision and editing. All authors contributed critically to drafts and approved the final draft.

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Data availability

All of the data that support the findings of this study are available in the main text.

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